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>

08/18/2004 02:10 PM

To: Jim Christiansen/EPR/R8/USEPA/US@EPA
cc:
Subject: Remediation Status Query Results

Jim -

Here are the results. One thing I noticed was that 85% of the properties completed had "remediation required triggers." The remaining 15% were categorized as either pending or remediation not required.

Remediation Not Required: 1238
Remediation Pending: 773
Remediation Complete: 248
Remediation Required: 1413

Total 3672
VCI 558

Indoor : 191
Contains rule #4 (VCI in attack): 181 (95%)
Contains rule #5 (dust > 5000): 13 (7%)
Contains rule #3 (secondary source): 131 (69%)
Contains rules 4 & 5: 3 (2%)

Outdoor: 829
Contains rule #7 (visual in expected use area): 804 (97%)
Contains rule #6 (soil >1%): 36 (4%)
Contains rules 6 & 7: 11 (1%)

Both: 393
Contains rule #4: 377 (96%)
Contains rule #5: 26 (7%)
Contains rule #6: 14 (4%)
Contains rule #7: 275 (70%)

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Analysis of Existing Data (Soils):

For Phase 1, 2, and Phase 1R (all non-CSS, including samples collected during removals), there was no specific protocol for noting the presence/absence of visible vermiculite or other contamination. Samplers/analysts may or may not have noted its presence. When vermiculite was noted, we can be reasonably sure that it really was present at some location in the yard, most likely at the location of the sample being collected. However, when it was not noted, we cannot at all be sure it was not present. Also, most of the non-CSS samples were biased – most of the Phase 1, Phase 2, and removal properties had visible vermiculite in soils or were collected at properties that were expected to require, or were undergoing, cleanup. So, we can assume that most (but not all) non-CSS properties had vermiculite present in the soils to some degree. This is supported by the fact that visible vermiculite was noted at 195 of 252 non-CSS properties queried by SRC. The likely number is probably higher. Given these facts, we would expect a high rate of detects for non-CSS samples, especially by property.

- There was at least one LA detect in soil for 57% of all non-CSS properties (252/440), even when vermiculite was not noted anywhere at the property.
- For only non-CSS properties where vermiculite was noted somewhere at the property, there was at least one LA detect in soil for 64% of the properties (195/304).
- For non-CSS samples with an indication of vermiculite, 41% were detect for LA.

- For the CSS, there was a specific protocol for noting vermiculite, and all properties were inspected. Property selection was not biased. The "visible vermiculite rule" was applied aggressively – generally even an observation of a few flakes was considered a "yes." I have good confidence in our observations. The rules to determine if samples would be collected were:

  - When vermiculite was not observed in an individual specific use area (SUA), a soil sample was collected in that SUA.
  - When vermiculite was observed in an individual SUA, a soil sample was not collected in that SUA.
  - When vermiculite was not observed in a section of the yard outside of an SUA, a soil sample was collected from that section of the yard.
  - When vermiculite was observed in a section of the yard outside of an SUA, a soil sample was collected from that section of the yard. (This occurred later during a revisit during RI sampling).

  So, we can assume that for SUAs, samples were only collected when vermiculite was not present. For yards, samples were collected all the time, and can be segregated into samples with vermiculite present or not present.

  - Need to figure out why so few CSS garden/flowerbed samples.

Montera/
Waldberg

- We can correlate yard samples in areas with vermiculite DIRECTLY to sample results. Only instance we have systematically collected samples in areas with visible vermiculite.
- Since samples were mostly collected in areas w/o visible vermiculite, overall rate of detects for CSS samples should be much lower than non-CSS (with maybe the exception of samples in yards with visible), and the concentrations should be low. Only 6% of all CSS samples collected in areas where visible vermiculite was not present were detect for LA (467/7792), and only 8 of those detects were $\geq$1% (only a .1% chance).

Analysis of Existing Data (Indoor):

- ATSDR Medical Screening indicated no correlation between VCI and lung abnormalities.
- Properties with vermiculite insulation appear no more likely to have detects of LA in dust on any floor/level than other properties with some indicator of potential dust contamination (25% versus 28% of all properties have at least one detect and 10% versus 8% for all samples), though dust is not sampled on floors/levels with visible insulation in living space – it is cleaned up. This may bias results low for properties with VCI.
- Need to determine frequency of dust detects for all properties with outdoor contamination (PLM detects or visible). This may take work. ~~We should have far more dust results.~~ OK. K

PHASE: CONTAMINANT SCREENING STUDY (CSS)
PLM Surface Soil Results Compared to Survey Descriptions

		Visible Vermiculite in Soils?		
		YES	NO	*Total*
PLM Detect in Surface Soil?	YES	299	462	*761*
	NO	1,630	7,490	*9,120*
	Total	*1,929*	*7,952*	*9,881*

where: PLM Detect = Bins B1, B2, and C

16% of all visibly contaminated soils were detect for LA
84% of all visibly contaminated soils were nondetect for LA

6% of all visibly uncontaminated soils were detect for LA
94% of all visibly uncontaminated soils were nondetect for LA

8% of all surface soil samples were detect for LA
92% of all surface soil samples were nondetect for LA

		Visible Vermiculite in Driveway?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	14	1%	101	4%	*115*	5%
	NO	64	3%	2075	92%	*2139*	95%
	Total	*78*		*2176*		*2254*	

		Visible Vermiculite in Flowerbed?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	79	4%	112	6%	*191*	10%
	NO	458	23%	1301	67%	*1759*	90%
	Total	*537*		*1413*		*1950*	

		Visible Vermiculite in Garden?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	20	3%	30	4%	*50*	7%
	NO	128	19%	493	73%	*621*	93%
	Total	*148*		*523*		*671*	

		Visible Vermiculite in Stockpile?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	2	5%	1	3%	*3*	8%
	NO	3	8%	34	85%	*37*	93%
	Total	*5*		*35*		*40*	

		Visible Vermiculite in Yard?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	184	4%	218	4%	*402*	8%
	NO	977	20%	3587	72%	*4564*	92%
	Total	*1161*		*3805*		*4966*	

Soil Evaluation Matrix

Frequency, Duration, and Quality of Human Soil Contact		**Soil factors potentially related to exposure**			**Measured Air Exposures** (personal vs Stationary)	
Location with respect to frequency & duration of human contact (Soil Use)	**Location with respect to activities likely to occur**	**Soil Conditions**	**Concentration of asbestos in soil (quantitative)**	**Visible Vermiculite (qualitative)**	**Workers**	**General Population; Naïve Workers**
High (frequent contact: eg play areas, gardens, driveways, walkways, high SUAs)	High Impact (gardening, sports, vehicles, remediation)	Barren, open	Actual Measurements Issues: Sampling Representativeness Exposure Area of Concern Analytical Sensitivity, LODs, LOQs, PLM-VE & TEM methods	High	Phase 1, CSS; Remediation PCM & limited TEM data	Phase 2 rototilling scenario
Med (e.g., yards)	Med Impact	Mixed		Med		
Low (low habitation areas, no current use or routine access)	Low Impact	Covered (grass)		Low		
Other		depth, moisture	Counting requirements, matrix confounders,		Perimeter backgrounds	Ambient Air

PHASE: CONTAMINANT SCREENING STUDY (CSS)
PLM Surface Soil Results Compared to Survey Descriptions

		Visible Vermiculite in Soils?		
		YES	NO	*Total*
PLM Detect in Surface Soil?	YES	294	467	*761*
	NO	1,796	7,325	*9,121*
	Total	*2,090*	*7,792*	*9,882*

where: PLM Detect = Bins B1, B2, and C

14% of all visibly contaminated soils were detect for LA
86% of all visibly contaminated soils were nondetect for LA

6% of all visibly uncontaminated soils were detect for LA
>>> (8/435 yard samples were Bin C, all others were B1 or B2)
>>> (0/3 garden samples were Bin C, all others were B1)
>>> (0/7 flowerbed samples were Bin C, all others were B1)
>>> (0/22 driveway samples were Bin C, all others were B1)
94% of all visibly uncontaminated soils were nondetect for LA

8% of all surface soil samples were detect for LA
92% of all surface soil samples were nondetect for LA

Yards likely account for most VCs "Yes" w/ sample result

		Visible Vermiculite in Driveway?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	6	23%	22	6%	*28*	7%
	NO	20	77%	360	94%	*380*	93%
	Total	*26*		*382*		*408*	

		Visible Vermiculite in Flowerbed?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	3	13%	7	11%	*10*	11%
	NO	20	87%	57	89%	*77*	89%
	Total	*23*		*64*		*87*	

		Visible Vermiculite in Garden?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	0	0%	3	16%	*3*	12%
	NO	7	100%	16	84%	*23*	88%
	Total	*7*		*19*		*26*	

		Visible Vermiculite in Stockpile?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	0	#DIV/0!	0	0%	*0*	0%
	NO	0	#DIV/0!	5	100%	*5*	100%
	Total	*0*		*5*		*5*	

		Visible Vermiculite in Yard?					
		YES		NO		*Total*	
PLM Detect in Surface Soil?	YES	285	14%	435	6%	*720*	8%
	NO	1749	86%	6887	94%	*8636*	92%
	Total	*2034*		*7322*		*9356*	

CSS by Property

Language is misleading

		Visible Vermiculite in Soils?		
		YES	NO	*Total*
PLM Detect in Surface Soil?	YES	335	171	*506*
	NO	836	1,338	*2,174*
	Total	*1,171*	*1,509*	*2,680*

properties w/ VCS had at least one sa-

29% of all visibly contaminated soils were detect for LA
71% of all visibly contaminated soils were nondetect for LA

11% of all visibly uncontaminated soils were detect for LA
89% of all visibly uncontaminated soils were nondetect for LA

19% of all surface soil samples were detect for LA
81% of all surface soil samples were nondetect for LA

properties had at least one detect

properties had no detects

DETAILED INFORMATION ON PLM SURFACE SOIL QUERIES (6/30/04)

Query Build Details:

Table Joins – All results must have a valid Analysis ID, all analyses must have a valid Sample ID, and all samples must have a valid Location ID.

tblLocation –
Property Address Is Not Null

tblSample –
Media [SampleMedia] is "soil-like"
Matrix [SampleMatrix] is "surface soil"
Sample QC Type [SampleQCTypeDesc] is "field sample"

tblAnalysis –
Analysis Method [AnalysisMethod] is "PLM-Grav" or "PLM-9002" or "PLM-VE"
Lab QC Type [AnalysisLabQCTypeDesc] Is Null or "Not a QA Result"

Interpretation of PLM Results:

PLM-VE Mass Fraction Results:
Characteristic ID is "MF"
Mineral Class is "LA"
    If Result Qualifier = "ND", then MF report "ND"
    If Result Qualifier = "Tr", then MF report "Tr"
    If Result Qualifier = "<", then MF report "<Result Value"
    Else report "Result Value"

PLM-VE Bin Results:
Characteristic ID is "BIN"
Mineral Class is "LA"
    Report "Result Bin"
Bins: A = ND, B1 = Tr, B2 = <Value, C = Detected Value

PLM-Grav Mass Fraction Results:
Characteristic ID is "LA"
Mineral Class is "LA"
    If Result Qualifier = "ND", then MF report "ND"
    If Result Qualifier = "Tr", then MF report "Tr"
    If Result Qualifier = "<", then MF report "<Result Value"
    Else report "Result Value"

PLM-9002 Mass Fraction Results:
Characteristic ID is "TREM-ACTN"
    If Result Qualifier = "ND", then MF report "ND"
    If Result Qualifier = "Tr", then MF report "Tr"
    If Result Qualifier = "<", then MF report "<Result Value"
    Else report "Result Value"

Assigning Detect/Non-Detect Status for an Analysis:
If Mass Fraction Result = "ND", then not detected (0)
If Mass Fraction Result <> "ND" (= "Tr", "<Value", or "Value"), then detected (1)

To combine Mass Fraction Results across Analyses for a Sample:
If Mass Fraction Result for any PLM analysis is detect (1), then sample classified as detect (1)
If Mass Fraction Results for all PLM analyses are non-detect (0), then sample classified as non-detect (0)

To combine Mass Fraction Results across Samples for a Property:
If Mass Fraction Result for any sample is detect (1), then property classified as detect (1)
If Mass Fraction Results for all samples are non-detect (0), then property classified as non-detect (0)

Number of Records:
(Libby 2DB as of 6/28/04)

Total # of Properties = 3,077

Total # of Locations Sampled = 14,320

Total # of Samples Collected = 14,551
- CSS = 10,356
- Phase 1 = 2,898
- Phase 1R = 984
- Phase 1D = 234
- Burlington Northern = 71
- BNSF Track = 2
- Not Specified = 6

Total # of PLM Analyses = 21,815
- PLM-Grav Analyses = 6,951
- PLM-VE Analyses = 10,451
- PLM-9002 Analyses = 4,413

Detection Frequency Results for Surface Soil Analyzed by PLM:

By Sample –
All Samples = 2,268 of 14,551 (16%)

CSS = 846 of 10,356 (8.2%)
Phase 1 = 1,048 of 2,898 (36%)
Phase 1R = 242 of 984 (25%)
Phase 1D = 98 of 234 (42%)
Burlington Northern = 32 of 71 (45%)
BNSF Track = 0 of 2 (0%)
Not Specified = 2 of 6 (33%)

By Property –
All Properties = 786 of 3,077 (26%)

DETAILED INFORMATION ON PLM SURFACE SOIL QUERIES COMBINED WITH SITE-SPECIFIC SURVEY DATA (6/30/04)

Query Build Details:

Table Joins – All survey results must have a valid Property Location ID. All question answers must have a valid "decode" entry.

Create a "crosstab query" that displays Question # in column header and decoded Answer in rows. *Note: it is not possible to display the comment field associated with each question in this format.*

Number of Records:
(Libby 2DB as of 6/28/04)

Total # of Properties Surveyed = 3,618 (at 3,770 locations)

Total # of Properties Surveyed with PLM Soil Results = 2,899

Soil samples were classified into the following categories based on the sample location comments to match with the outdoor contamination areas identified in the survey:

Flowerbed (current and former)
Garden (current and former)
Driveway
Stockpile
Yard
Other
Note: If sample location comments did not identify the location category type, soils were assumed to be "Yard" unless clearly specified otherwise (e.g., crawl space).

IFF Survey Questions that provided location-specific contamination information within a property include:
Question 22 – Location of Outdoor Vermiculite = Driveway (Y/N)
Question 23 – Location of Outdoor Vermiculite = Flowerbed (Y/N)
Question 24 – Location of Outdoor Vermiculite = Garden (Y/N)
Question 25 – Location of Outdoor Vermiculite = Yard (Y/N)
Question 26 – Location of Outdoor Vermiculite = Former Flowerbed (Y/N)
Question 27 – Location of Outdoor Vermiculite = Former Garden (Y/N)
Question 28 – Location of Outdoor Vermiculite = Stockpile (Y/N)
Question 29 – Location of Outdoor Vermiculite = None (Y/N)
Question 29 – Location of Outdoor Vermiculite = Other (Y/N, location specified in comments)

All soil samples were classified as PLM Detect (1) or PLM Nondetect (0). Each location category (Flowerbed, Garden, etc.) within a property was classified as having visible vermiculite present (1) or absent (0) based on the survey results. For example if Question 23 or Question 24 were "YES", then the flowerbed for the property was assigned as 1. If Question 23 and Question 24 were "NO", then the flowerbed for the property was assigned as 0.